

**REMARKS**

Claims 1, 2, 4-20, 22-49, 51-60, and 62-72 are pending in the present patent application. None of the claims is presently amended. The Office Action Summary of October 25, 2004, indicates that each of the pending claims are rejected. Applicants respectfully note, however, that none of the rejections is directed to claims 71 and 72. The Office Action rejects claims 1, 2, 4-20, 22-49, 51-60, 62-64, and 69 under the first paragraph of 35 U.S.C. § 112 for alleging that these claims fail to comply with the written description requirement. The Office Action rejects claims 45 and 46 under the second paragraph of 35 U.S.C. § 112 alleging that these kit claims are indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Finally, the Office Action rejects claims 65-70 under 35 U.S.C. § 102(e) alleging that these claims are anticipated by U.S. Patent No. 6,284,197 issued to Abbott et al (the "'197 patent").

Applicants respectfully request that the Examiner consider the following remarks with respect to the rejections set forth in the Office Action. In view of the following remarks, reconsideration and withdrawal of the rejections to the claims in the application is respectfully requested. Applicants believe that the application is now in condition for allowance.

**Rejection of Claims 1, 2, 4-20, 22-49, 51-60, 62-64, and 69****Under the First Paragraph of 35 U.S.C. § 112**

Applicants thank Examiner Cole for noting that the previous rejection of claims 1-4, 6-14, 16-22, 24-36, 43-61, 63 under 35 U.S.C. § 102 for allegedly being anticipated by the '197 patent has been withdrawn based upon Applicants' arguments in the Amendment and Request for Reconsideration filed July 29, 2004.

The Office Action rejects each of claims 1, 2, 4-20, 22-49, 51-60, 62-64, and 69 under the first paragraph of 35 U.S.C. § 112 for allegedly failing to comply with the written description requirement. With respect to this rejection, the Office Action states,

The claim(s) contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s) at the time the application was filed, has possession of the claimed invention. Applicant has amended the claims to include the recitation of metal functional groups to functionalize the alkanethiol. However, even though Applicants has pointed to instances in the specification that are supposed to support the amendment, support is not found for many of the recited metals. Moreover, even where the metal is mentioned, it is not clear that there is support for the instant claim amendments. Further clarification and/or cancellation is required.

Applicants respectfully traverse the rejection of claims 1, 2, 4-20, 22-49, 51-60, 62-64, and 69 for allegedly failing to comply with the written description requirement. In the Amendment and Request for Reconsideration filed July 29, 2004, Applicants amended independent claims 1, 17, 45, 47, and 60 to specify that the metal of the functional group (claims 1, 17, and 45) or the metal complex (claims 47 and 60) is a "metal selected from the group consisting of Cd, Rb, K, Li, Cs, Ag, Au, Zn, Ti, Cr, Mn, Fe, Co, Ni, Zr, Nb, Ru, Rh, Hf, Ta, Re, Os, Ir, Pt, La, Sn, and Eu". Dependent claim 69 was also added which specifies that the metal of the metal complex is one of these same metals.

On pages 19 and 20 of the Amendment and Request for Reconsideration filed July 29, 2004, Applicants provided the following support for the amendment of claims 1, 17, 45, 47, and 60, and claim 69.

Claim 1:	Claim 1 as originally filed, [0050], [0055], [0088], [0099], [00102], [00103], [00131], [00147], and FIG. 10;
Claim 17:	Claim 17 as originally filed, [0050], [0055] [0088], [0099], [00102], [00103], [00131], [00147], and FIG. 10;
Claim 45:	Claim 45 as originally filed, [0050], [0055] [0088], [0099], [00102], [00103], [00131], [00147], and FIG. 10;
Claim 47:	Claims 47, and 59 as originally filed, [0050], [0055] [0088], [0099], [00102], [00103], [00131], [00147], and FIG. 10;
Claim 60:	Claim 60 as originally filed, [0050], [0055] [0088], [0099], [00102], [00103], [00131], [00147], and FIG. 10;
Claim 69:	[0050], [0055] [0088], [0099], [00102], [00103], [00131], [00147], and FIG. 10;

Unfortunately, Applicants included [0055] in the above paragraphs rather than paragraph [0065]. The Examiner will observe that [0065] of the specification states,

Preferred functional groups include carboxylic acids and metal carboxylates the latter of which are preferably formed by contacting a metal salt with a carboxylic acid. **An especially preferred functional**

**group is a carboxylic acid group on an alkanethiol and metal carboxylates formed therefrom.** Preferred alkanethiols with carboxylic acid groups include alkanethiols with the formula  $\text{HS}(\text{CH}_2)_n\text{CO}_2\text{H}$  where  $n$  is selected from 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, or 20 or more preferably where  $n$  is inclusively from 5 to 18, inclusively from 8 to 12, or where  $n$  is 10. **Preferred metal carboxylates include those prepared from transition metals such as, but not limited to, Cu, Ag, Au, Zn, Ti, V, Cr, Mn, Fe, Co, Ni, Zr, Nb, Mo, Ru, Rh, Pd, Hf, Ta, W, Re, Os, Ir, and Pt, and other metals such as La, Sn, and Eu.** In addition to the above list and  $\text{Cu}^{+2}$ , preferred metal salts for preparation of metal complex functional groups include  $\text{Ni}^{2+}$ ,  $\text{Ir}^{3+}$ ,  $\text{Zn}^{2+}$ ,  $\text{Co}^{2+}$ ,  $\text{Mn}^{2+}$ ,  $\text{Fe}^{3+}$ ,  $\text{V}^{3+}$ ,  $\text{Sn}^{4+}$ ,  $\text{La}^{3+}$ ,  $\text{Ag}^{1+}$ ,  $\text{Zr}^{4+}$ , and  $\text{Eu}^{3+}$ .

[0065] (Emphasis added)

As shown above, paragraph [0065] specifically recites each of the metals added by the amendment except for Cd, Rb, K, Li, and Cs for which support is set forth in [00131] of the application. In addition to describing specific metals that may be used in accordance with the invention, paragraph [0065] sets forth a list of exemplary metal salts that may be used to prepare metal complex functional groups of the invention such as those recited in the claims including " $\text{Ni}^{2+}$ ,  $\text{Ir}^{3+}$ ,  $\text{Zn}^{2+}$ ,  $\text{Co}^{2+}$ ,  $\text{Mn}^{2+}$ ,  $\text{Fe}^{3+}$ ,  $\text{V}^{3+}$ ,  $\text{Sn}^{4+}$ ,  $\text{La}^{3+}$ ,  $\text{Ag}^{1+}$ ,  $\text{Zr}^{4+}$ , and  $\text{Eu}^{3+}$ ." Furthermore, the preparation of a metal complex functional group using an ethanol solution containing  $\text{Cd}(\text{NO}_3)_2$  is described in [00131] of the application. Applicants, therefore, respectfully contend that the disclosure set forth in the specification, and particularly in paragraphs [0065] and [00131], provides a written description adequate to reasonably convey to those skilled in the art that the inventors possessed the invention at the time the application was filed. For this reason, Applicants respectfully request that the Examiner reconsider and withdraw the rejection of claims 1, 2, 4-20, 22-49, 51-60, 62-64, and 69. If the Examiner should withdraw the rejection of these claims, then Applicants respectfully submit that claims 1, 2, 4-20, 22-44, 47-49, 51-60, and 62-64 should be allowable as these claims are only rejected under the first paragraph of 35 U.S.C. § 112.

### **Rejection of Claims 45 and 46 Under the Second Paragraph of 35 U.S.C. § 112**

The Office Action rejects claims 45 and 46 under the second paragraph of 35 U.S.C. § 112 alleging that they are indefinite for failing to particularly point out and

distinctly claim the subject matter applicant regards as the invention. With respect to this rejection, the Office Action states,

These claims are rendered indefinite because it is unclear what applicant intends to constitute as 'the kit.' The claims are currently presented merely spell out the components of the device that is already being claimed. Do components (b) and (c) come in vials that are poured onto the substrate? Are the components separately packaged in some way that the user must consolidate? It is the Examiner's suggestion that these claims be cancelled if the kit is nothing more than another way of claiming the consolidated device.

Applicants respectfully traverse the rejection of claims 45 and 46 for the reasons set forth below.

Applicants respectfully direct the Examiner's attention to M.P.E.P. § 2173.05(g), which states:

In a claim that was directed to a kit of component parts capable of being assembled, the Court held that limitations such as "members adapted to be positioned" and "portions ... being resiliently dilatable whereby said housing may be slidably positioned" serve to precisely define present structural attributes of interrelated component parts of the claimed assembly. In *re Venezia*, 530 F.2d 956, 189 USPQ 149 (CCPA 1976).

Therefore, if the description of the kit in the claim defines the attributes of the interrelated components, the kit claim should be allowed. The Examiner will observe that claim 45 sets forth "[a] kit for detecting the presence of a compound in a sample, comprising: (a) a substrate having a support with a metallized top surface; (b) an alkanethiol comprising a functional group that reversibly or irreversibly interacts with the compound; and (c) a liquid crystal having a moiety that interacts with the functional group of the alkanethiol." Applicants submit that claim 45 is definite for reciting the components needed for the kit, in the same manner that the structural attributes of interrelated component parts were found to be definite in *Venezia*.

In further support of their contention, Applicants point out that independent claim 1, directed to a device, includes "(b) a self-assembled monolayer comprising an alkanethiol attached to the metallized top surface of the substrate..." When the elements of claims 1 and 45 are compared, Applicants submit that it is readily apparent that the kit claims do not merely spell out the components of the device. The kit comprises as its components, a substrate, an alkanethiol, and a liquid crystal, and it is

those components that may then be used to prepare a device comprising a substrate, a self-assembled monolayer, and a liquid crystal. In the device, the alkanethiol is no longer a separate entity as it is in the kit. Rather, it is a fully integrated portion of the device. For these reasons, Applicants respectfully request that the Examiner reconsider and withdraw the rejection of claims 45 and 46.

### **Rejection of Claims 65-70 Under 35 U.S.C. § 102**

The Office Action rejects claims 65-70 under 35 U.S.C. § 102(e) for allegedly being anticipated by U.S. patent No. 6,284,197 (the "'197 patent") issued to Abbott *et al.* With respect to this rejection, the Office Action states,

Abbott teaches liquid crystal devices that detect the interaction of any analyte with a surface to which the liquid crystal is coupled (col. 13, lines 4-7, 11-17). The substrate is made of at least one metal that may be laterally adjacent to one another (col. 15, lines 45-55). Copper may be the metal used in Abbott. Abbott teaches self-assembled monolayers formed from alkanethiols on thin, semi-transparent films of gold, Au, (col. 19, lines 28-31). The liquid crystal taught by Abbott can be nematic (col. 30, lines 48-54). The liquid crystal can be 4-cyano-4'-pentylbiphenyl (col. 32, lines 7-9). See also col. 18, line 48; col. 44, lines 62-65; col. 50, lines 19-28.

Applicants respectfully traverse the rejection of claims 65-70 for the reasons set forth below. As set forth in § 2131 of the M.P.E.P., "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.' *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)." Applicants respectfully contend that the '197 patent does not anticipate any of the claims of the present application because the cited reference fails to teach each and every element of any of the independent claims. For this reason, the rejection of each of the claims must fail.

#### **1. Claims 65 and 66**

Independent claim 65 is similar to original independent claim 47 and original dependent claim 59 and is directed to a method for manufacturing a device for detecting the presence of a compound in a sample. The method includes contacting an alkanethiol that has a functional group with the metallized surface of a support to form a

self-assembled monolayer. The method of independent claim 65 also includes “contacting a first region of the self-assembled monolayer with a first metal salt to produce a first region with a first metal complex and contacting a second region of the self-assembled monolayer with a second metal salt different from that of the first metal salt to produce a second region of the self-assembled monolayer with a second metal complex that is distinct from the first region of the self-assembled monolayer.”

Therefore, the method of independent claim 65 includes contacting at least two regions of a self-assembled monolayer (formed by contacting an alkanethiol with the metallized surface of a support) with at least two different metal salts to produce at least two regions with metal complexes which are distinct from one another. Therefore, claim 65 is drawn to a method that includes a metallized surface, a first metal salt, a second metal salt, a first metal complex, and a second metal complex. Applicants respectfully contend that the ‘197 patent fails to teach any device or method for manufacturing a device for detecting compounds which includes two or more regions with different metal complexes or the use of two or more different metal salts.

Applicants have reviewed each of the passages of the ‘197 patent cited by the Examiner. None of these passages discloses any device or method including a self-assembled monolayer formed on a metallized surface that includes at least two regions with metal complexes distinct from one another that are formed by contacting different regions of the self-assembled monolayer with at least two different metal salts.

Therefore, the reference simply fails to teach each and every element of independent claim 65, and the rejection must fail. The Examiner cites col. 15, lines 45-55 and col. 19, lines 28-31 with respect to the substrate material being copper and the formation of a self-assembled monolayer formed from an alkanethiol on gold. The copper and gold referred to in these passages are the substrate or the metallized surface that the self-assembled monolayer is formed on after contact with an alkanethiol. These passages thus teach nothing with respect to contacting a self-assembled monolayer that is already formed on a metallized surface with any metal salt. In fact, the copper and gold mentioned in these passages are not even metal salts. Because the passages cited by

the Examiner do not teach each and every feature of independent claim 65, the rejection of this claim must fail.

Dependent claim 66 depends from independent claim 65. Therefore, dependent claim 66 includes every limitation of independent claim 65 and is also not anticipated by the '197 patent. Dependent claim 66 further specifies that the second metal complex is a  $\text{Cd}^{+2}$  carboxylate. The '197 patent simply fails to teach any device that includes a  $\text{Cd}^{+2}$  carboxylate. Therefore, for this additional reason, claim 66 is not anticipated by the '197 patent.

## **2. Claims 67-72**

Independent claim 67 is similar to original independent claim 60 and original dependent claim 59 and is directed to a device for detecting the presence of a compound in a sample. The device includes a surface with functional groups. As set forth in independent claim 67, "the functional groups are bonded to a first metal in a first region forming a first metal complex and the functional groups are bonded to at least a second different metal in at least a second region of the surface forming at least a second metal complex." Therefore, independent claim 67 is drawn to a device that includes a surface with functional groups and at least two regions, one of which includes a first metal complex in which the functional groups are bonded to a first metal, and another of which includes a second metal complex in which the functional groups are bonded to a second metal. Applicants respectfully contend that the '197 patent fails to teach any device or method for manufacturing a device for detecting compounds which includes two or more regions with different metal complexes as set forth in claim 67.

Because the reference fails to teach each and every element of independent claim 67, the rejection of this claim must fail. Dependent claims 68-72 each depend from independent claim 67. Therefore, dependent claims 68-72 include every limitation of independent claim 67 and are also not anticipated by the '197 patent. Dependent claim 69 further specifies that the second metal complex comprises "a metal selected the group consisting of Cd, Rb, K, Li, Cs, Ag, Au, Zn, Ti, Cr, Mn, Fe, Co, Ni, Zr, Nb, Ru, Rh, Hf, Ta, Re, Os, Ir, Pt, La, Sn, and Eu." The '197 patent simply fails to teach any device that includes any one of these metals. Therefore, for this additional reason,

claim 69 is not anticipated by the '197 patent. Dependent claim 70 further specifies that the second metal complex is a  $\text{Cd}^{+2}$  carboxylate. The '197 patent simply fails to teach any device that includes a  $\text{Cd}^{+2}$  carboxylate. Therefore, for this additional reason, claim 70 is not anticipated by the '197 patent.

### CONCLUSION

In view of the above remarks, it is respectfully submitted that all rejections and objections have been overcome, and that this application is in condition for allowance. The Examiner is cordially invited to telephone the undersigned at the number listed below if the Examiner believes such would be helpful in advancing the application to issuance.

Respectfully submitted,

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